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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09-647,479	09-29-2000	Barry Huston Meyrick	PM-271586-SM	7070

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05-20-2003

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EXAMINER

SHOSHIO, CALLIE E

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 05/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/647,479

Applicant(s)

MEYRICK ET AL.

Examiner

Callie E. Shosho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-8 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-8 and 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/13/03 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 3, 5-8, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 732381 alone, or alternatively, in view of Lent et al. (U.S. 5,837,042).

EP 732381 disclose an ink jet ink composition comprising 1-50% water-dissipatable polyurethane obtained from reaction of diisocyanate and polyol, water, 2-20% colorant including dye, 0.1-10% water-miscible organic solvent, and water-immiscible organic solvent. It is further disclosed that the dye can be dissolved in organic solvent or dispersed in fine particles. It is also disclosed that the ink is filtered through a filter which has pore size less than 1 μm . There is also disclosed a method wherein the above ink is jetted onto a substrate using an ink jet printer (page 2, lines 50-54, page 3, lines 8-11, page 5, lines 34-35, page 8, lines 16-22 and 29-32, page 9, lines 12-16, page 10, lines 31-36 and 49-54, and page 13, lines 1-6). Although there is no disclosure of an ink jet printer cartridge, it is clear that the ink jet printer of EP 732381 would intrinsically contain the ink in a cartridge.

The difference between EP 732381 and the present claimed invention is the requirement in the claims of (a) weight average molecular weight of polyurethane and (b) the amount of water-immiscible organic solvent and the viscosity of the ink.

With respect to difference (a), there is no explicit disclosure in EP 732381 of the weight average molecular weight of the polyurethane.

On the one hand, given the relationship between molecular weight and viscosity, i.e. as the molecular weight increases, the viscosity increases, it would have been obvious to one of ordinary skill in the art to choose polyurethane with molecular weight, including that presently claimed, in order to control the viscosity of the ink, and thereby arrive at the claimed invention.

On the other hand, Lent et al., which is drawn to ink jet ink, disclose the use of polyurethane which has weight average molecular weight of 4,000-12,000 (col.10, lines 52-56) wherein the polyurethane has good adhesion to substrate and serves to immobilize or increase the adhesion of the colorant to the substrate (col.8, lines 40-51).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use polyurethane with specific weight average molecular weight disclosed by Lent et al. as described above in the ink of EP 732381 in order to produce an ink with good adhesion to substrate, and thereby arrive at the claimed invention.

With respect to difference (b), it is noted that col.9, lines 7-14 of EP 732381 disclose that the water-immiscible solvent is used in order to control the viscosity of the ink. It would have been within the skill level of one of ordinary skill in the art to recognize that if the viscosity of an ink jet ink is too high, the ink would clog the printer nozzles, while if the viscosity is too low, the ink would print poorly on the page.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control the amount of water-immiscible solvent in the ink of EP 732381 to amounts, including those presently claimed, in order to control the viscosity of the ink to levels suitable for use in ink jet printing, and thereby arrive at the claimed invention.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 732381 alone, or alternatively, in view of Lent et al. (U.S. 5,837,042) and Johnson et al. (U.S. 5,165,968).

EP 732381 disclose an ink jet ink composition comprising water-dissipatable polyurethane obtained from reaction of diisocyanate and polyol, water, colorant including dye, and water-miscible organic solvent. It is further disclosed that the dye can be dissolved in organic solvent or dispersed in fine particles (page 2, lines 50-54, page 3, lines 8-11, page 5, lines 34-35, page 8, lines 16-22 and 29-32, page 9, lines 12-16, page 10, lines 31-36 and 49-54, and page 13, lines 1-6).

The difference between EP 732381 and the present claimed invention is the requirement in the claims of (a) weight average molecular weight of polyurethane and (b) benzyl alcohol.

With respect to difference (a), there is no explicit disclosure in EP 732381 of the weight average molecular weight of the polyurethane.

On the one hand, given the relationship between molecular weight and viscosity, i.e. as the molecular weight increases, the viscosity increases, it would have been obvious to one of ordinary skill in the art to choose polyurethane with molecular weight, including that presently claimed, in order to control the viscosity of the ink, and thereby arrive at the claimed invention.

On the other hand, Lent et al., which is drawn to ink jet ink, disclose the use of polyurethane which has weight average molecular weight of 4,000-12,000 (col.10, lines 52-56) wherein the polyurethane has good adhesion to substrate and serves to immobilize or increase the adhesion of the colorant to the substrate (col.8, lines 40-51).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use polyurethane with specific weight average molecular weight disclosed by Lent et al. as described above in the ink of EP 732381 in order to produce an ink with good adhesion to substrate, and thereby arrive at the claimed invention.

With respect to difference (b), it is noted that EP 732381 discloses the use of water-miscible solvent such as lower alcohols "and the like" which are utilized as penetrating agents. however, there is no disclosure of benzyl alcohol as presently claimed.

Johnson et al., which is drawn to ink composition, disclose the use of one or more alcohols including ethanol and benzyl alcohol as penetrating agents (col.2, line 65-col.3, line 2). It is well known that penetrating agents are used in ink compositions in order to control the drying speed of the ink.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use benzyl alcohol as penetrating agent in the ink of EP 732381 in order to produce ink with desired drying speed, and thereby arrive at the claimed invention.

Response to Arguments

6. Applicants' arguments filed 2/13/03 have been fully considered but they are not persuasive.

Specifically, applicants argue that given that EP 732381 discloses crosslinked colorant containing polyurethane fine particles which comprises gel component ratio of at least 50%, the polyurethane cannot have weight average molecular weight of less than 25,000 as required in the present claims. As evidence to support this position, applicants cite "Principles of Polymerization"¹ (page 113) which states that gels are insoluble in all solvents and correspond to an infinite network in which polymer molecules are crosslinked to each other where such infinite network would possess infinite molecular weight not molecular weight less than 25,000 as presently claimed.

However, while EP 732381 discloses that the polyurethane has certain gel component ratio, this does not necessarily mean that the polymer must have enormous or infinite molecular weight. The molecular weight depends on the size of the individual chains which comprise the crosslinked polyurethane as well as how crosslinked the polymer is. That is, a polymer which is highly crosslinked but comprises polymer chains of low molecular weight could have lower overall molecular weight than polymer which is lightly crosslinked but comprises polymer chains of high molecular weight. Additionally, it is noted that the polyurethane of EP 732381 can possess gel component ratio as low as 50%. Further, it is not clear how the polyurethane of EP

¹ Applicants state on page 4 of the amendment filed 2/13/03 that a copy of page 113 of "Principles of Polymerization" is enclosed with the amendment. Examiner was unable to find such enclosure. Therefore, the examiner has attached to the present office action, and cited on PTO-892, the citation to "Principles of Polymerization" believed to be referred to by applicants.

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732781 could possess infinite molecular weight as argued by applicants given that EP 732381 is drawn to ink jet ink and if the ink were to comprise polyurethane with enormous or infinite molecular weight, it would necessarily follow that the ink would possess enormous or infinite viscosity which would result in the ink clogging the ink jet printer nozzles.

Applicants also argue that since the colorant in EP 732381 is contained within the polyurethane particles, the colorant cannot come into contact with any solvent phase in the ink composition.

However, the present claims only require that the colorant is soluble in the water-immiscible solvent. There is no requirement that the colorant actually dissolves or disperses in the solvent or comes into contact with the solvent. Further, page 8, line 17 of EP 732381 discloses that the dye dissolves in organic solvent. Additionally, it is noted from the examples of EP 732381 that the dyes utilized are in fact solvent soluble dyes, i.e. Solvent Black, which are the same dyes utilized in the present invention.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho

Callie E. Shosho

Examiner

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May 3, 2003